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ABSTRACT

This introduction and overview is part of a seven-section report that investigates how individual competence is defined and assessed in the settings of education and work. Following background rationale, the first portion develops a definition of competence as "a characteristic of an individual that underlies effective work performance." Focus throughout is on work performance as the target of competence, rather than on the broader area of life performance that subsumes it. Overviews are provided of the individual chapters: (1) Competence Assessment and Personnel Selection: Current Practices and Trends, (2) Assessment Centers: Theory, Practice, and Implications for Education, (3) Competence Assessment for Certification in the Professions, (4) The Definitions and Measurement of Competence in Higher Education, (5) Competence Assessment and the Courts: An Overview of the State of the Law, and (6) Summary: A Synthesis of Issues. The issues identified and described briefly here are the definition of competence, the discrepancy between actual practice and ideal practice, the definition of validity, barriers to improving the state of the practice, and implications for curriculum content. Each of the six chapters is available separately--see note. (LRA)

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# THE ASSESSMENT OF OCCUPATIONAL COMPETENCE

## FINAL REPORT

Edited by

George O. Klemp, Jr.

Prepared for the
National Institute of Education
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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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# THE ASSESSMENT OF

# OCCUPATIONAL COMPETENCE

## I. INTRODUCTION AND OVERVIEW

George O. Klemp, Jr.
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Individuals, employers, professional organizations, trade associations, and educational institutions are experiencing an increasing pressure to assess and document fairly and accurately that which persons can do well, and to match what these persons are capable of doing well to the requirements of occupations in our society. The public cry for the accountability of educational institutions is shaking the walls from elementary schools to professional graduate schools. The demand is for educational processes to prepare individuals to perform effectively in a variety of occupational endeavors. There is also a demand for equity in employment opportunities; people who can do a job well should be granted equal access to job opportunities, regardless of their background or other characteristics unrelated to their ability to perform.

The concept of competence is a link between the world of work and the world of education, between employees and the expectations of organizations which hire them, between an individual's current vocational activities and the performance standards established in the public interest. A person who is adequately and appropriately prepared to perform a job will perform that job more competently than a person lacking this preparation.

The processes of licensing, certification, employment selection, and performance appraisal will meet their goals

only if there is a clear image of what is needed to perform effectively in a given occupation. If the image of what is needed in the world of work is absent, or even vague or confusing, educational institutions will not be able to design and provide experiences which adequately and appropriately prepare persons for the world of work.

This report is devoted to an investigation of how individual competence is defined and assessed in the settings of education and work. The need for this study has emerged from a number of sources, each having its own set of problems regarding how competence is assessed. Employers need to know the qualities required for successful job performance and whether their selection procedures are appropriate, accurate, and nondiscriminatory. Licensing and accrediting agencies must maintain the quality of work performance that is needed for the protection of the public interest, but not at the expense of excluding persons on the basis of characteristics not related to job performance. Educators need to know if their programs are increasing the competence of their students to deal effectively with life and work, and how to assess competence gained through experience both inside and outside the classroom.

The notion of "competence" finds antecedent in Robert White's work on the need to manipulate one's environment effectively and the rewards which spring from doing so. For

many assessment practitioners, competence is inexorably intertwined with performance. Performance-based learning and assessment programs have proliferated especially during the last twenty years. Organizations in the private and public sectors are attempting to base personnel screening procedures on performance models, through structured interviewing and the use of validated tests and measures. They are also implementing self-assessment and training programs to help employees determine and maximize their own capabilities. Some organizations are also revitalizing the concepts of the assessment center, developed during World War II, to assess competence.

Professional organizations and consumer protection groups have also entered the assessment movement, through their concern with public documentation of a person's ability to practice a trade or profession. The courts, too, have taken an active interest in competence assessment, largely in instances when assessment practices were at odds with the principles of fairness and equity in employment and educational opportunity.

Finally, a number of educational institutions have begun to restructure curricula to correspond to competencies rather than grades or scores on standardized achievement tests. Teachers are experimenting with experiential learning and other nontraditional processes to improve their ability to teach with competent performance in mind, rather than to rely on grades alone.

## A Definition of Competence

But what is competence? There are almost as many definitions of competence as there are people interested in the subject. Nevertheless, the kernel of competence lies in effective performance by an individual. For the purposes of this report, we define a competency, or component of overall competence, as a characteristic of an individual that underlies effective work performance. A competency can be any human quality:

- It can be knowledge, a category of usable information organized around a specific content area (for example, knowledge of mathematics);
- It can be a skill, an ability to demonstrate a set of behaviors or processes related to a performance goal (for example, logical thinking);
- It can be a trait, a consistent way of responding to an equivalent set of stimuli (for example, initiative);
- It can be a self-schema, a person's image of self and his or her evaluation of that image (for example, self-image as a professional); or
- It can be a motive, a recurrent concern for a goal state or condition which drives, selects, and directs behavior of the individual (for example, the need for efficacy).

A person may possess many of these characteristics, but by our definition, if the knowledge, skill, trait, self-schema, or motive is not explicitly related to effective performance, it is not a competency.

The present report focuses on work performance as the target of competence, rather than on the broader area of life performance which subsumes it. To make coherent the discussion

of the link between work and education, clearly some limitation on the reference to performance is needed. Changing the performance referent will affect which competencies are examined to some extent, and a useful study could be made of competencies related to life in general. As will be noted later, educators in particular are interested in life competencies at least as much as they are interested in job competencies, but though an investigation of the assessment of life competence would be fruitful, it would be the subject of an entirely different report. The present definition of a competency is intended as the defining parameter of that which is to be assessed in this state-of-the-practice study.

It is important at the outset, therefore, to differentiate what a competency is from that which it is not. A competency underlies effective performance. This means that, while competencies enable individuals to perform job tasks, competencies are not the same as tasks. Competence is a cause of effective performance, not a synonym for it. In recent years, as the rhetoric of competence has infiltrated the domains of job analysis and behavioral objectives in education, competencies have been taken erroneously in terms of their historical meaning as labels for task performance. Many practitioners, accordingly, have invested much time and effort constructing extensive lists of job tasks and the knowledge and skills that appear related to these tasks. Attention to the performance of individual tasks, rather than to what it takes to do the whole job well, would limit our

examination of important areas of competence. To illustrate, the tasks performed by a nurse include carrying out standard medical procedures, many of which require both substantial technical knowledge and manual dexterity. But if patients were asked to list the qualities of a good nurse, one would receive a set of characteristics different from that produced by a task analysis, including the ability to show genuine concern, personal warmth, listening skill, and a sense of humor. Our view of competence as underlying performance is therefore intended to cast as wide a net as possible in examining assessment issues relating to effective performance of the total job.

A competency can be either generic or specific. Some competencies are applied to a number of similar work situations in the same way, producing similar results. Many kinds of technical knowledge (like qualitative chemical analysis) and psychomotor skills (like playing the piano) are such specific competencies. Generic competencies, by contrast, manifest themselves differently in both similar and dissimilar work situations. For example, the ability to think clearly and logically enables the same individual to organize the daily work load, to communicate ideas to others, and to generate solutions to problems. Competencies based on knowledge tend to be more specific in nature, while skills, traits, self schemata, and motives tend to be more generic. Both specific and generic competencies may be equally important to effective

performance and are often applied simultaneously in accomplishing a cask. Planning a budget, for example, requires specific knowledge of accounting practices and some facility with numbers, as well as more generic competencies like logical organization. Questions may legitimately arise however, as to whether generic competencies are more appropriate as formal education objectives and whether specific competencies are more appropriate as training objectives or work requirements; and these questions will be addressed in this report.

Finally, it is necessary to distinguish optimal competencies which are related to outstanding performance from minimal competencies which are required for basic performance levels, but which do not differentiate the outstanding from the average performer. Too often in the past, psychologists have discovered an essential competency, like being able to read a transit schedule, and then devised a test which gives more credit to an individual who can read schedules quickly, when there was no evidence that speed in reading schedules was required for the job. On the other hand, assessment specialists might overlook a competency such as the efficient use of time because it wasn't particularly obvious as a characteristic of typical job performers, even though the top performers might delegate scheduling tasks to a subordinate in order to have time for more important things. Both minimal and optimal competencies are important, but the relative emphasis placed on each will vary according to the philosophies, goals, and political realities of the assessing organization.

## The Organization of the Report

This report examines the assessment of occupational competencies from three perspectives: that of the users of assessment procedures in the world of work; that of institutions of higher education in their identification and measurement of student competence; and that of the courts in ruling on the use of assessment devices. Furthermore, three topics within assessment in the world of work occupy separate chapters: employment selection, the first threshold, for most, between education and work; the assessment center, a technique with application in employee appraisal and promotion as well as selection; and professional licensing and certification, processes sometimes invoked to ensure minimal competence in certain career areas.

Each chapter of this report approaches the notion of competence and its assessment somewhat differently, owing to the issues and interests which are unique to the subject areas treated. The following synopsis is intended to give the reader the flavor of each of the five major chapters, emphasizing how competence assessment is addressed.

### Chapter 1: Competence Assessment and Personnel Selection: Current Practices and Trends

This chapter presents competence assessment as it is defined in practice by selection techniques currently used by employers. It seeks an understanding both of how job-related

competencies are identified by employing organizations in general, and how the assessment process itself defines the competencies that are used as selection criteria. The chapter begins with a discussion of the major techniques used in employee selection, focusing on the competencies they detect and their measurement properties. The writing then takes an empirical turn. The focus switches to the ways in which selection techniques are used as components of selection systems within a variety of organizations. Among the questions addressed here are the following: Do employers actually select on the basis of the competencies they desire in job applicants? How do selection practices vary according to the type of job and level of skill required at entry? What biases enter into selection decisions as a function of the procedures used? And to what extent do employers verify the importance of certain competencies to job performance or the effectiveness of their selection procedures? The chapter concludes with a discussion of how organizational realities and other factors affect selection practices and what educators can learn from current trends in these practices. This chapter has a strong quantitative flavor, emphasizing the measurement aspects of competence assessment in the context of application.

Chapter 2: Assessment Centers: Theory, Practice, and Implications for Education

The assessment center, a recent development in competence assessment with origins in personality theory, occupies a

chapter of its own because of its elaborate method, its current popularity for assessing employee potential in complex jobs, and its increasing application in educational settings. The topic is presented first in its historical context, through which its evolution is traced and examined. What follows is a description of current assessment center practice, involving a broad representative sample of presently active assessment centers. As in the opening, much data is presented to illuminate both quantitative and qualitative aspects of the process. The process and the results of the assessment center are discussed in depth, to illuminate key issues for the researcher and practitioner: Is the assessment center useful as a method of ascertaining the presence or absence of specified competencies? Does it measure performance potential or current ability? To what use do organizations put the data that they gather on individuals? And what are the consequences of implementing assessment centers for the persons who are assessed and for the implementing organizations? The chapter concludes with an examination of the functions assessment centers serve for the organizations that use them. Their utility to education is also discussed, through a recapitulation of critical issues that must be addressed by the educator before employing the technique.

## Chapter 3: Competence Assessment for Certification in the Professions

Certification, broadly defined, is a credential-awarding process which may be voluntary (e.g., registration) or required (e.g., licensure) for an individual prior to entering the world of work. Certification occupies a middle ground between education and employment selection, and the popular notion is that it ensures possession of the minimal competencies required to perform well on the job. This issue is raised, and questioned, from the perspective of the consumer of services performed by the individual possessing the credential. To provide an understanding of the current practice of competence assessment as a component of certification, the chapter elaborates the process of how an occupation becomes a "profession," as this process has a strong influence on how competencies are identified and defined. In the course of describing the purposes and function of licensing and certification, particular attention is paid to the link between specifying the credential-awarding process and setting the goals that are established for the process. Following a description of the career areas in which certification plays an active role, the definition and measurement of competence is discussed using examples from prominent current practices. The process of deciding who is to be certified is discussed in conjunction with considerations of test construction and statistical validation. Among the key issues addressed in this chapter are the following: What is the

relationship between certification and competence? Does certification ascertain minimal performance standards or are there other functions it performs that are more important? And, how do certification procedures direct educational priorities, with reference to the requirements of the world of work?

Chapter 4: The Definition and Measurement of Competence In Higher Education

The competency-based education (CBE) movement has focused much recent attention on how learning objectives are defined and assessed. Though this movement has made progress in secondary and technical schools, it has crystallized to such a degree in higher education that a significant number of programs have become visible nationally as CBE, or "outcome-oriented," institutions. This chapter begins by reviewing the prominent CBE programs, their institutional objectives, and how competencies are identified and assessed. In particular, the degree to which institutional goals influence the identification and assessment process is examined in this chapter, with traditional programs as a comparison. Some of the questions to which this chapter responds are the following: What are the distinctions between CBE and more traditional programs in the way they go about assessing competence? Is CBE something new, or is it a new label for an old set of values and practices? How does the specification of competencies shape curriculum content? How does the practice of

assessment affect student learning? And how do assessment procedures limit or distort the competencies that are defined as curriculum objectives? Following the review of the state of the practice, an "ideal" model for competency definition is introduced. This model becomes the framework for a discussion of the practical directions that institutions of higher education can take in pursuing their goals, within some of the real-world limitations imposed by tradition, the faculty, time, and financial resources.

Chapter 5: Competence Assessment and the Courts: An Overview of the State of the Law

In this chapter, the focus of the report shifts from a study of the state of the practice in competence assessment to a review of how the courts have responded to assessment practices. The difference in the perspectives held by the users and originators of assessment procedures and those held by the courts is developed by examining key court cases which followed upon the enactment of Title VII of the 1964 Civil Rights Act. How the courts have come to interpret issues of test reliability and validity is viewed in the context of individual assessment practices, the interest being to ensure plaintiffs equal access to opportunity under the law. As noted in the other chapters, what the courts have had to say has dramatically shaped the practice of competence assessment. The decisions of the courts, rather than the contexts within which they were

made, have had the greater impact on how assessment techniques are used by employers and educators. Nevertheless, the facts surrounding the cases, rather than the decisions themselves, have greater relevance to changes in the state of the assessment practice from the courts' perspective. In light of the courts' present posture, the implications of this difference in perspective are discussed for selection, licensing and certification, and educational assessment. The topics addressed include the use of the diploma or degree as a hiring requirement; the fairness of licensing and certification procedures as gateways to professions, with an emphasis on teacher certification; the use of IQ tests and other measures of general ability for classifying students; minimal competence assessment and the accountability of educational institutions; and the use of graduate school admission tests to select applicants fairly for the limited number of available places. The chapter concludes with a summary of the conditions under which the courts will tend to scrutinize competence assessment practices as well as suggestions for further legal research.

## Key Issues Addressed by the Report

The diverse issues pertaining to the assessment of occupational competence, as raised under these five chapters, require a final synthesis which is provided by a sixth chapter to conclude this report. This synthesis is organized around

six themes which surface with varying degrees of regularity within each of the five substantive chapters. In bringing together the issues, it will be seen how common and disparate perceptions of the state of assessment practice shape the present and point to future directions for both educators and employers.

1. The definition of competence

The ways in which institutions and employers define competence have profound effects on the specification of assessment procedures. To understand these effects, we trace the relationships among the missions of the users of assessment, the process by which competencies are identified, and the specification of competencies as generic/specific and as minimal/optimal. We address the impact of these distinctions for education on the job or in the classroom and for performance of the workforce, particularly as they pertain to the debate surrounding whether or not people should be educated and selected for minimum performance or for excellence. Is "minimum competence" a contradiction in terms, or does setting excellence as the standard deny the "good" performer a niche in the world of work? And what are the practical tradeoffs between selecting or training for specific competencies rather than generic competencies? Both individual biases and the climate in which competencies are derived affect the relative "importance" attached to each. So given, it is necessary to ask what

are the effects of such factors on the practice of assessment and the quality of work performance.

The competencies identified are products of the philosophy and environment of those who identify them. They are also products of the methods by which they are assessed. Construction of tests and measures, for example, is as much an art as a science, thus different measures often prove to be uncorrelated even though they purport to measure the same ability. There is also the large possibility of a gap between the competency one originally intended to measure and the characteristic of the individual that is actually measured and subsequently used for assessment.

2. The discrepancy between actual practice and ideal practice

The present report is, first, a study of the state of the practice in competence assessment: what is currently being done and what are the best examples from current practice. But the best of practice is not the same as ideal practice or the state of the art in assessment as described by researchers. Each chapter raises the issue, is the ideal the "best" in a practical sense? We discuss the limitations of educators and employers in their assimilation and use of new assessment technologies; and we explore the limitations on realistic expectations of the extent of improvements possible in assessment practice.

This report examines--and dispels--many assumptions about the general quality of competence assessment, and in so doing

provides insight into how situational realities often place severe limitations on the measurement of human performance in education and work settings. However, certain of the chapters address the gap separating actual and ideal practice as an invitation to action steps that employers and educators can take to significantly improve current assessment procedures. In each case the goal is not to push actual practice toward becoming the same as the ideal, but to enable it to come closer to the best practice that is attainable within realistic expectations.

3. The definition of validity

Validity of an assessment device is broadly defined as the extent to which it measures what it claims to measure. This seemingly simple issue is made complex by many different aspects of validity which are important for assessment. The major types of validity discussed in the present report are face validity (upon cursory inspection, does the device look as if it is measuring what it claims?); content validity (does the device adequately sample the domain of the ways in which a competency can be expressed?); construct validity (does the device provide data that correlates sufficiently well with other measures of the same competency?); concurrent validity (does the device provide data that correlates with the present performance level of students or job incumbents?); and predictive validity (does the device provide data that correlates with later performance?). As validity is an estimate of truth

in measuring some criterion, the nature of the criteria specified is critical in understanding what a validity coefficient, or the measure of relatedness to the criterion, really means. Face validity is in the eye of the beholder; content validity is a judgment call, not amenable to quantitative analysis; and construct validity is defined by the other tests one chooses to relate to the measure in question. Only concurrent and predictive validity are referenced to individual performance; but here, too, we must examine which aspect of performance is defined. If we are interested in job performance as the criterion for competence, we may rightfully question the validity of a measure whose sole claims to truth are based in correlations with school grades or aptitude tests.

Another aspect of validity, which places a different emphasis on the meaning of a measure, is <u>educational validity</u> or the degree to which a measurable aspect of competence can be developed through education or other experience. Some competencies behave more like traits and are difficult to change, while others, such as abilities and knowledge, may be more easily acquired. Though educational validity might not be of immediately obvious relevance to employers and the courts, it is of clear interest to educators who must understand the extent to which they can develop the competencies that are required, or at least selected for, in the workplace. But just as one should be able to develop certain competencies, so should measures of these competencies be sensitive enough to track the process of their development.

## 4. Barriers to improving the state of the practice

Although each of the chapters addresses the improvement of assessment practice to some extent, there are always barriers to realizing the ideal. The nature of the assessing organizations dictates the particular blocks to progress that are encountered. Nevertheless, four general sources of difficulty continuously reoccur. The first and most visible of these barriers is cost. Well-documented and validated selection, appraisal, certification and education assessment systems are expensive, and in many cases the preliminary job analysis needed to determine the competencies important to assess is even more expensive. Tradeoffs are constantly made to accommodate an assessment goal within the limits of what an institution can afford. When costs grow out of proportion to the perceived utility of competence assessment, the state of the practice suffers. The individual chapters deal with this issue in relative terms in order to convey an understanding of the expenses involved in employing different measurement techniques.

A second barrier is a political one, involving interests both inside and outside the assessing organization. Where assessment is used to perpetuate the norm or to protect the interests of job incumbents, the notion of competence can become an irrelevant issue. Institutional philosophy, as well, may determine that some areas of human performance are to be assessed (or not assessed) for ideological reasons, rather than reasons based on any demonstrated validity. The

roles of the government and the courts are also examined to the extent that they have put pressures on institutions which have interfered with competence assessment.

Paradoxically, both concern and lack of concern for equity and equal employment opportunity can present a third barrier to progress. Concern for fairness and equal treatment in selection and promotion practices, at the expense of considerations of individual competence, can have a regressive effect on the quality of education and on the performance of the workforce. On the other hand, the door is left open to both inequity and invalidity of measurement when those who define competencies are either of a biased perspective (e.g., basing competence assessment on the performance of white males only) or who do not check if the chosen measures correlate with factors such as race and sex, which would not be expected to have a bearing on job performance.

Finally, there is the barrier of legitimacy, or how much of the use of assessment practice is based on faith in the system rather than on evidence. Validity is often a less important consideration than whether the assessment procedure "looks good" to those responsible for it and those whose interests and reputations rest on it. If we must believe in a system to use it, does this mean that face validity is, in reality, the primary criterion for the success of an assessment program? If so, what does this imply for advancing the state of the practice?

5. Implications for curriculum content

Interwoven throughout this report are references to the implications of a particular application of competence assessment for various issues of interest to educators. Of greatest importance is whether the findings have implications for what educators actually do. For example, do current selection and certification practices provide any insight into the competencies that educators should strive to develop in students? Should educators consider only those insights provided by the state of assessment practice? How may educational institutions forge links with the world of work to better determine the kinds of competencies that will meet the goals of both educators and employers?

Throughout this report, we consider the limitations, both practical and necessary, of the role of formal education in competency identification, development and assessment processes, and how many of these tasks are shared by the employing organization. This will have a bearing on assessing and developing competence through experience outside the classroom, and on a broader definition of competence and its assessment, which includes formal education as an important but not the sole component.

## A Summary of Issues

The preceding has been an introduction to the content and issues addressed by the chapters that follow. For those

readers whose interests are limited to a few of the chapters or to a few specific issues, the following summary table provides an illustration of which chapters place particular emphasis on which major themes. Here it is clear that Chapter 5, which focuses on the courts, is quite different from the other chapters according to the issues it considers and the way it considers them. All five themes are touched upon in this chapter, but the courts' perspective on competence assessment is unique and many of the themes are addressed between the lines. Those readers who are more concerned with the implications of court decisions on the areas covered by other chapters are referenced to Chapter 6, the conclusion of this report.

This report crystallizes much of the state of the practice of competence assessment during the last three decades. The degree to which practice has changed in the areas considered in this report is instructive, for it serves as both a guide and a warning to those changes we might expect in the coming years. The extent to which this report becomes useful in reflecting those changes beneficial to advancing an understanding of the complexities of human competence and the assessment thereof, and in inhibiting those trends which are injurious to the public interest in the long run, will be the extent to which it will have achieved its purpose.

ISSUES EMPHASIZED IN CHAPTERS 1-5
AND SUMMARIZED IN CHAPTER 6

| MAJOR THEMES | CHAPTERS OF THE REPORT | | | | |
|---|---|---|---|---|---|
| | 1 Personnel Selection | 2 Assessment Centers | 3 Certification | 4 Higher Education | 5 The Courts |
| (1) Definition of Competence | ✓ | | ✓ | ✓ | |
| (2) Discrepancy Between Actual and Ideal Practice | ✓ | ✓ | ✓ | ✓ | ✓ |
| (3) Definition of Validity | ✓ | ✓ | ✓ | ✓ | |
| (4) Barriers to Improving the State of the Practice | ✓ | | ✓ | ✓ | ✓ |
| (5) Implications for Curriculum Content | ✓ | | ✓ | ✓ | |

✓ = this theme is emphasized